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Publication number	516232
Title	Structure and process integration for producing transistors having independently adjustable parameters
Publication Date	2003/01/01
Certification_Number	169622
Application Date	2000/04/13
Application No.	089106874
IPC	H01L-029/772
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Priority Number	1999/07/22 US19990359291
Abstract	The process rules for manufacturing semiconductor devices such as MOSFET^s are modified to provide dual work-function doping following the customary gate sidewall oxidation step, greatly reducing thermal budget and boron penetration concerns. The concern of thermal budget is further significantly reduced by a device structure which allows a reduced gap aspect ratio while maintaining low sheet resistance values. A reduced gap aspect ratio also relaxes the need for highly reflowable dielectric materials and also facilitates the use of angled source-drain (S-D) and halo implants. Also provided is a novel structure and process for producing a MOSFET channel, lateral doping profile which suppresses short channel effects while providing low S-D junction capacitance and leakage, as well as immunity to hot-carrier effects. This also affords the potential for reduction in the contact stud-to-gate conductor capacitance, because borderless contacts can be formed with an oxide gate sidewall spacer. As a result, the S-D junctions can be doped independently of the gate conductor doping, more easily allowing a variety of MOSFET structures.

Patent Right Change

Application number	089106874
Authorization note	No
Qualification right note	No
Transfer Note	No
Inheritance Note	No
Trust note	No
Objection note	No

Exposure Note	No
Invalidation date	
Withdrawal date	
Issue date of patent right	20030101
Due date of patent right	20200412
Due date of annual fee	20081231
Due year of annual fee	006